

TWO NEW NORTHERN ANDEAN SPECIES OF *AULONEMIA*
(POACEAE: BAMBUSOIDEAE: BAMBUSEAE: ARTHROSTYLIDIINAE)
WITH VERRUCOSE CULMS

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ABSTRACT

Aulonemia notata and *A. verrucosa* are two distinctive new Colombian and Venezuelan species of vining bamboos (Poaceae: Bambusoideae: Bambuseae: Arthrostylidiinae) with verrucose culms having raised dark siliceous dots and purple-maculate spikelets. *Aulonemia notata*, from the Cordillera Oriental in Táchira, Venezuela, has awnless spikelets 22–35 mm long with florets 9–10.5 mm long, while *A. verrucosa*, from the Cordillera Central and Serranía de Perijá in Colombia, has larger, awned spikelets 40–70(–80) mm long, with larger florets 13–16 mm long. These species are described and illustrated. A key to the species of *Aulonemia* with verrucose culms is also provided.

RESUMEN

Aulonemia notata y *A. verrucosa* son dos nuevas especies diferenciables de bambúes trepadores de Colombia y Venezuela (Poaceae: Bambusoideae: Bambuseae: Arthrostylidiinae), con culmos verrugosos, cubiertos por puntos protuberantes y silíceos oscuros y por espiguillas maculadas de púrpura. *Aulonemia notata* ocurre en la Cordillera Oriental en el Estado de Táchira, Venezuela, tiene espiguillas no aristadas de 22–35 mm de longitud con flósculos de 9–10.5 mm de longitud, mientras que *A. verrucosa* ocurre en Colombia en la Cordillera Central y en la Serranía de Perijá, y tiene espiguillas aristadas de mayor tamaño, 40–70(–80) mm de longitud, con flósculos más largos 13–16 mm de longitud. Estas especies son descritas e ilustradas. Se incluye también una clave para las especies de *Aulonemia* con culmos verrugosos.

KEY WORDS: Poaceae, Bambusoideae, Arthrostylidiinae, *Aulonemia*, Colombia, Venezuela

INTRODUCTION

Exploration of the northern Andes continues to reveal new species in the woody bamboo genus *Aulonemia* Goudot (Poaceae: Bambusoideae: Bambuseae: Arthrostylidiinae). In the last two decades novelties have been described from Venezuela (Judziewicz et al. 1991; Judziewicz 2004; Judziewicz & Riina 2005), and Colombia (Clark & Londoño 1990; Clark et al. 1997, 2007). This study is based upon examination of material from these herbaria: CAS, COL, F, K, MO, ISC, NY, P, UC, US, TULV, UWSP and WIS. Two distinctive new species may now be added to the genus. Both are delicate, vining bamboos with raspy culms that have the appearance and texture as if gritty bits of purple sand have been embedded in the surface (of evident utility when climbing) of the culms. Verrucose, “raspy” culms are otherwise known in *Aulonemia* only in several southern Brazilian and Argentinian species formerly placed in the segregate genus *Colantheia* McClure & E.W. Smith (Judziewicz et al. 1999; Tyrrell et al. 2012; Santos-Gonçalves et al., in prep.). The species of *Aulonemia* with verrucose culms may be distinguished by the following key:

1. Fertile florets 13–16 mm long, tipped with awns 3–6 mm long; foliage leaf blades 9–17 cm long, 1.7–2.8 cm wide; Colombia _____ **A. verrucosa** Londoño, Judz. & L.G. Clark
1. Fertile florets 7–10.5 mm long, awnless (some species mucronate); foliage leaf blades 2–13 cm long, 0.3–1.7 cm wide. _____ **A. lanciflora** McClure & L.B. Smith
2. Fertile florets 2(–3), 4–5 mm long; spikelets 9–11 mm long; Brazil _____ [Colantheia lanciflora McClure & L.B. Smith) McClure]
2. Fertile florets 3–16, 6–10.5 mm long; spikelets 8–80 mm long. _____ **A. notata** McClure ex Judz., L.G. Clark & Londoño
3. Fertile florets 9–10.5 mm long; Colombia _____ [Colantheia notata McClure & L.B. Smith) McClure]
3. Fertile florets 7–9 mm long; Brazil. _____ **A. intermedia** McClure & L.B. Smith [Colantheia intermedia McClure & L.B. Smith) McClure]
4. Foliage leaf sheaths without auricles; fertile florets 5–16 (typically at least 7) _____ **Colantheia burchellii** (Munro) McClure [not yet transferred into *Aulonemia*]
4. Foliage leaf sheaths bearing fimbriate auricles; fertile florets 3–8. _____ **A. cingulata** McClure & L.B. Smith [Colantheia cingulata McClure & L.B. Smith) McClure]
5. Culm leaf sheaths without apical fimbriae or auricles; fertile florets 8–9 mm long _____ **A. cingulata** McClure & L.B. Smith [Colantheia cingulata McClure & L.B. Smith) McClure]
5. Culm leaf sheaths bearing apical fimbriae and sometimes also inconspicuous auricles; fertile florets 8–11 mm long _____ **A. cingulata** McClure & L.B. Smith [Colantheia cingulata McClure & L.B. Smith) McClure]

Many of the Brazilian congeners of *Aulonemia notata* and *A. verrucosa* in the key above also have purple-spotted glumes and lemmas; this character is otherwise known in *Aulonemia* only in the Costa Rican endemic *A. viscosa* (Hitche.) McClure, a much more robust, larger-leaved species with smooth, viscid culms.

Aulonemia notata McClure ex Judz., L.G. Clark & Londoño, sp. nov. (**Fig. 1a–e**). TYPE: VENEZUELA. TACHIRA: between Villapaez [sic, for Villa Páez, 7°29'N, 72°27'W] and Betania [7°27'N, 72°26'W], along Río Tachira, bordering Colombian-Venezuelan boundary, 7000–7500 ft [2130–2285 m], 12 Jul 1944, climbing, flowers purple; NV: pajilla or corta calson, Steyermark 57165 (HOLOTYPE: VEN; ISOTYPES: F-3, US-2).

Vining, climbing bamboo with slender culms ca. 2 mm in diameter, the internodes hollow, verrucose, purple-maculate, the nodes with 1 mm thick girdle present. Nodes slightly swollen, producing 1–3 subequal branches. Culm leaf sheaths 2.5–3.5 cm long, bladeless (in available material), striate, glabrous, the apex acute or truncate. Foliage leaves in complements of 3–5; sheaths glabrous, purple-maculate, the margins smooth; sheath auricles absent; fimbriae confined to sheath summit, 4–8 mm long, delicate, purple or golden, basally erect, apically curling, easily rubbed off, excelsior-like; outer ligule 0.1–0.2 mm long, glabrous, shiny, stramineous, ciliolate-margined; inner ligule 0.2–0.3 mm long, brown, puberulous, ciliate-margined; pseudopetioles 2–3 mm long, glabrous, stramineous; blades 6–8 cm long, 1.2–1.6 cm wide, lanceolate, strongly reflexed, slightly asymmetrical at the base, long-acuminate at the apex, glabrous, concolorous or with a slightly darker stripe along one margin beneath. Synflorescence usually with base included in uppermost leaf sheath, paniculate 6–12 cm tall, 4–8 cm wide, ovoid, delicate, the branches lax, smooth and capillary; spikelets 22–35 mm long, 3–5-flowered, glabrous or very finely puberulent throughout and finely maculate with purple spots; lower glume absent or represented by a scalelike bract 0.2–0.4 m long often present 0.5–1 mm below spikelet; second glume obtuse, narrowly elliptical to broadly lanceolate, awnless, obtuse, 7.5–9 mm long, 5–7-nerved; lowest floret apparently staminate only, the upper florets 1–3, fertile, 9–10.5 mm long, lanceolate, acute to apiculate (apiculi best developed on apical lemmas and then up to 0.7 mm long), 7–9-nerved; paleas 6–8 mm long, narrowly lanceolate, shorter and narrower than the lemmas, bicarinate, ciliolate on the keels, minutely bifid. Flowers with lodicules not evident in spikelets examined; stamens apparently 2, the anthers 2.7–3.5 mm long, yellow-brown; gynoecium not seen. Fruit not seen.

Known from one collection in Venezuela made along the Río Táchira on the Colombian border. *Aulonemia notata* is clearly related to the Colombian endemic *A. verrucosa*; the latter species has larger spikelets 40–70(–80) mm long, with longer (13–16 mm) florets with 3–6 mm long awns. Based on annotations on the US isotype made by the late Thomas R. Soderstrom in 1974, Floyd A. McClure (1897–1970) recognized that this species was undescribed and suggested the epithet “notata”, doubtlessly an allusion to the maculate culms and spikelets. The spikelets are peculiar in that they lack a well-developed lower glume; the second glume is large and well-developed, and the succeeding floret appears to be staminate.

Aulonemia verrucosa Londoño, Judz. & L.G. Clark, sp. nov. (**Figs. 1f–l, 2–3**). TYPE: COLOMBIA. ANTIOQUIA: Municipio Entrerrios, ca. 3 km from Entrerrios [6°33'58"N, 75°31'03"W on Google Earth] on road to Santa Rosa de Osos [6°38'56"N, 75°27'48"W on Google Earth], downstream from bridge along Río Grande, 6°32'N, 75°30'W, 2250 m, common much-branched scandent grass, spikelets dark maroon, 5 Feb. 1989, J.F. MacDougal & F.J. Roldán 3664 (HOLOTYPE: HUA; ISOTYPES: ISC, MO-2, UWSP).

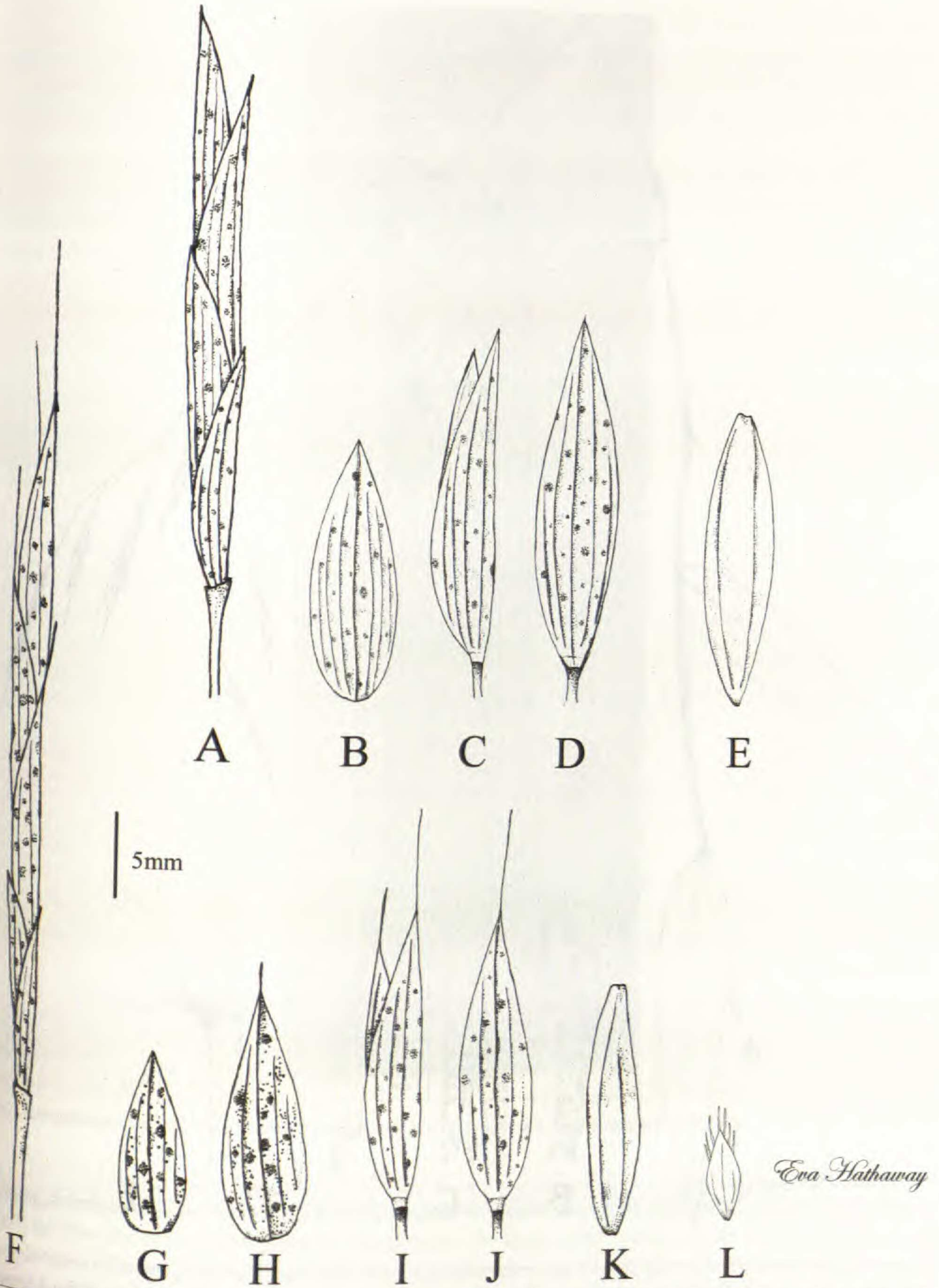


FIG. 1. Spikelets of *Aulonemia notata* (A-E) and *A. verrucosa* (F-L). A. Spikelet, lateral view. B. Upper glume, dorsal view. C. Fertile floret, lateral view. D. Fertile floret, dorsal view. E. Palea, dorsal view. F. Spikelet, lateral view. G. Lower glume, dorsal view. H. Upper glume, dorsal view. I. Fertile floret, lateral view. J. Fertile floret, dorsal view. K. Palea, dorsal view. L. Lodicule. *Aulonemia notata* based on Steyermark 57165 (US); *A. verrucosa* based on MacDougal & Roldán 3664 (ISC, UWSP). Illustration by Eva C. Hathaway.



FIG. 2. *Aulonemia verrucosa*. A. Habit showing branching and culms. B. Detail of branching. C. Culm internode showing verrucose papillae. D. Segment of culm showing three culm leaves. E. Base of foliage leaf blade showing delicate fimbriae. Based on Cuatrecasas & R. Romero-Castañeda 25306 (US). Illustration by Eva C. Hathaway.

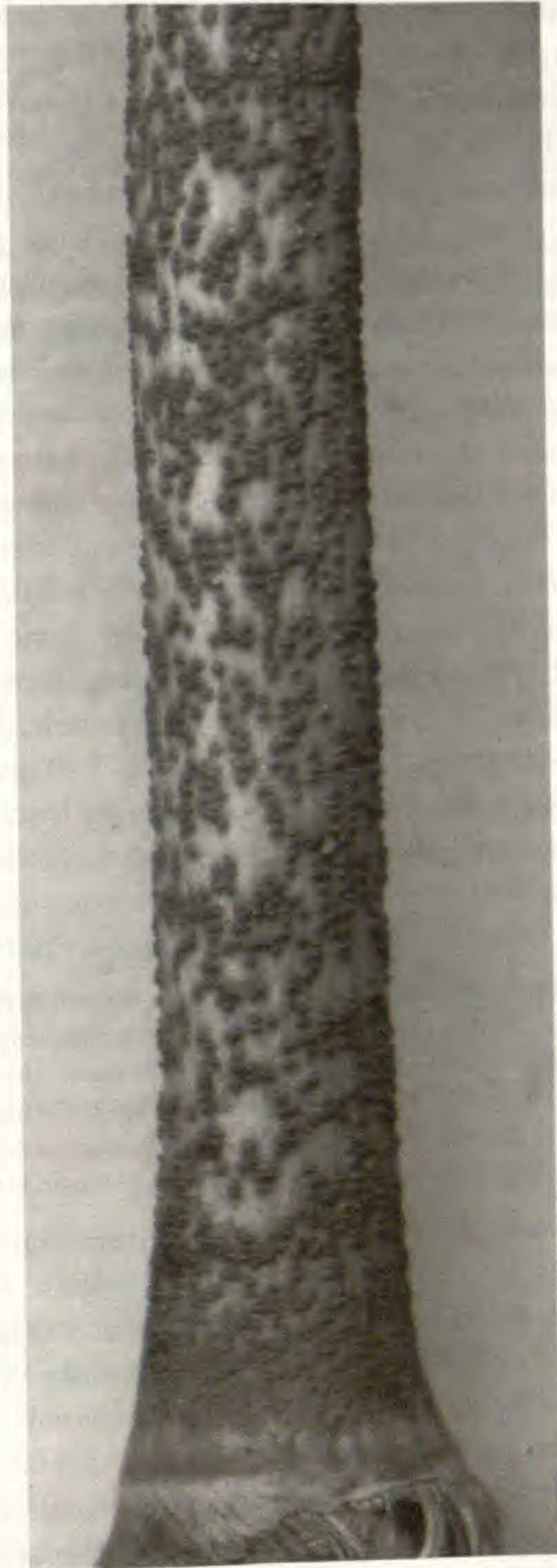


FIG. 3. *Aulonemia verrucosa*. Culm internode showing verrucose papillae. Cuatrecasas & R. Romero-Castañeda 25306 (US).

Vining, scandent, delicate, intricately-branched bamboo. Culms 1.5–4 mm in diameter, hollow with a lumen ca. $\frac{1}{3}$ the diameter of the culm, glabrous, stramineous, the larger, older culms densely verrucose with raised purple-black siliceous papillae about 130–180 μm in diameter and 45–100 μm tall, the more slender, upper portions of the culms merely purple-maculate with papillae absent. Nodes slightly swollen, with an evident girdle 1–2 mm wide, producing (on lower, large culms) 1 strongly ascending branch with a distal internode ca. 1 cm long, the first node producing primordia that may develop into adventitious roots, the upper nodes producing up to 3 subequal branches. Culm leaves (seen only in Dept. Magdalena collections) with a skirt present at juncture of sheath and girdle, the sheaths 3–5 cm long, striate orangish-brown, the margins finely ciliolate, the apex acute, truncate, or slightly concave, glabrous or (if concave) fringed with a few delicate 2–3 mm gold-

en-brown fimbriae, the inner ligule 0.3–0.5 mm long, puberulous, the blades 7–12 mm long, 1.5–3 mm wide, ovate-lanceolate, ascending, divergent, or reflexed, pubescent, deciduous. Foliage leaves in loose complements of 3–5; sheaths glabrous, striate, stramineous or obscurely green-maculate, often strongly suffused with purple near the summit, lacking auricles but one side of the sheath summit elevated by 1 mm as a “shoulder”; marginal fimbriae absent, terminal fimbriae usually absent, if present then sparse, delicate, and 4–10 mm long; outer ligules 0.2–0.3 mm long, indurate; inner ligules 0.2–0.4 mm long, ciliolate; pseudopetioles 2–5 mm long, purplish, adaxially pubescent; blades 9–17 cm long, 1.7–2.8 cm wide, lanceolate, ascending to reflexed, obtuse to somewhat asymmetrical to very slightly subcordate at the base, long-acuminate at the apex, glabrous above, glabrous to sparsely puberulent beneath, the margins cartilaginous and antrorsely scabrous, concolorous or with a slightly darker stripe along one margin beneath. Peduncle 2–5 cm long, glabrous. Synflorescence an ovoid panicle 10–22 cm tall, 8–15 cm wide, the few branches lax and capillary, the spikelet pedicels all glabrous and smooth. Spikelets 40–70(–80) mm long, slender, stramineous but strongly suffused with purple due to the abundant purple spots, finely and densely appressed-puberulent to pubescent throughout, the florets overlapping such that the summit of one floret extends about halfway up the length of the succeeding floret; scalelike bract 0.3–1 mm long often present 0.5–1 mm below spikelet; lower glume 7–12 mm long, linear-lanceolate, acute to apiculate, 5–7(–9)-nerved; upper glume 9–13 mm long, linear-lanceolate to lanceolate, acute to apiculate, 7–9-nerved; fertile florets 4–6, the lowermost floret sometimes sterile, the uppermost 1 or 2 floret(s) stertrorsely scabrous awn 3–6 mm long; paleas 8–13 mm long, narrowly lanceolate, shorter and narrower than and concealed by the lemmas, bicarinate, ciliolate on the keels, minutely bifid. Flowers with lodicules 3, 0.8–1.2 mm long, rhombic, acute, transparent, obscurely 2–3-nerved, tipped with erect clear cilia 0.3–0.5 mm long; stamens 3, the anthers 4 mm long, linear; pistils with 2 hispid stigmas. Fruit not seen.

Other specimens examined: **COLOMBIA. CESAR/MAGDALENA:** Mpio. Manaure, Serranía de Perijá, via Manaure-Sabana Rubia, between Finca Inglaterra and El Cinco, 10°23–24'N, 72°59'W, 2200 m, 24 July 1989, somewhat disturbed primary montane forest, sterile bamboo at edge of forest, culms viny, delicate, no more than 2–3 mm diam, forming a tangled mass, culm leaves with a skirt present at juncture of sheath and girdle, X. Londoño & L. Clark 472 (COL, ISC, TULV, US); Serranía de Perijá, E of Manaure, Hoya del Río Manaure, San Antonio, 1700 m, 14 Nov. 1959, subandean high forest, canes branched, intricate, sterile, J. Cuatrecasas & R. Romero-Castañeda 25306 (US-4 sheets; the COL sheet of this number is the panicoid grass *Lasiacis sorghoidea* (Desv. ex Ham.) Hitchc. & Chase).

Aulonemia verrucosa is a vining species that has culms with distinctive raised siliceous purple “warts”, and elongate, slender, awned, purple-maculate spikelets. A Colombian endemic, it occurs in the Cordillera Central of Antioquía and in the Serranía de Perijá in Cesar/Magdalena about 500 km to the northeast, at elevations from 1700–2250 m (and perhaps up to 2620 m). It is clearly related to the Venezuelan endemic *A. notata*; the latter species has smaller, awnless spikelets 22–35 mm long with florets only 9–10.5 mm long.

The fertile type specimen from the Department of Antioquía has efimbriate foliage leaves with blades 9–12 cm long and 1.7–2.2 cm wide while the sterile Department of Magdalena collection has larger leaf blades 12–17 cm long and 2–2.8 cm wide, and sheaths with well-developed fimbriae 4–10 mm long; it could represent a separate taxon, but we await fertile material before describing it as such.

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